CLAIMS

1. An R-T-B based sintered magnet having a composition comprising:

27.0 mass% to 32.0 mass% of R, which is at least one of Nd, Pr, Dy and Tb and which always includes either Nd or Pr;

63.0 mass% to 72.5 mass% of T, which always includes Fe and up to 50% of which is replaceable with Co;

0.01 mass% to 0.08 mass% of Ga; and

0.85 mass% to 0.98 mass% of B.

2. The R-T-B based sintered magnet of claim 1, further comprising at most 2.0 mass% of M, which is at least one element selected from the group consisting of Al, Si, Ti, V, Cr, Mn, Ni, Cu, Zn, Zr, Nb, Mo, In, Sn, Hf, Ta and W.

3. The R-T-B based sintered magnet of claim 1 or 2, comprising a main phase with a tetragonal $R_2T_{14}B$ type crystal structure, which accounts for at least 90% of the overall volume of the magnet, and including substantially no $R_{1.1}Fe_4B_4$ phases.

4. The R-T-B based sintered magnet of claim 1 or 2, having an oxygen concentration of at most 0.5 mass%, a nitrogen concentration of at most 0.2 mass%, and a hydrogen concentration of at most 0.01 mass%.

5. A method for producing an R-T-B based sintered magnet, the method comprising the steps of:

preparing a powder of an alloy that has a composition comprising 27.0 mass% to 32.0 mass% of R (which is at least one of Nd, Pr, Dy and Tb and which always includes either Nd or Pr), 63.0 mass% to 72.5 mass% of T (which always includes Fe and up to 50% of which is replaceable with Co), 0.01 mass% to 0.08 mass% of Ga and 0.85 mass% to 0.98 mass% of B;

compacting and sintering the alloy powder, thereby making a sintered magnet; and

subjecting the sintered magnet to a heat treatment at a temperature of 400 ℃ to 600 ℃.

6. The method of claim 5, wherein the step of preparing the alloy powder includes the steps of:

preparing a melt of the alloy;

rapidly cooling and solidifying the melt of the alloy by a strip casting process, thereby making a rapidly solidified alloy; and

pulverizing the rapidly solidified alloy.